CHAPTER 43

GUIDELINES FOR PAVEMENT MARKINGS AND SIGNAGE

43.1 Introduction

This work shall consist of establishing the location of existing pavement markings and installing proposed pavement markings, pavement markers, and reflective material on specified pavements in accordance with these specifications, the **MUTCD** and as directed by the **Traffic Services Administration**.

Permanent pavement markings consist of hot thermoplastic markings (white and yellow) to be placed on asphaltic concrete surfaces and plastic markings with a black border for concrete surfaces. For temporary work, the contractor may use reflective tape (white and yellow) or paint. In no case will the use of temporary lane markings require destructive measures, such as grinding, for removal from permanent roadway surfaces.

43.2 General

- Type and Location of Pavement Markings - The Traffic Services Administration, Traffic Safety Branch shall make the final determination in regards to the type and location of pavement markings within the ROW during the review of the project pavement marking and signing plans.
- Opening of Roadway - The roadway shall have permanent pavement markings in place prior to the opening of any lanes, unless provisions have been made on the Traffic Control Plan and approved the District.

43.3 Pavement Markings

Whenever, pavement markings are shown on any type of drawing plan sheet, the following **Legend of Pavement Markings** must be located on each plan sheet showing any pavement markings. This entire legend must be shown in full and includes the following items: (NOTE: The legend may be modified only with the approval of the TSA engineer.)

43.3.1 Legend of Pavement Markings (If shown:)

- Crosswalks shall be 15 ft. wide, unless otherwise noted.
- Crosswalk lines shall be white and 6 in. wide.
- Parallel line crosswalks are 2 ft. wide (white stripes) with 2 ft. spacing. Make stripes parallel to the curb line of the street. Edge lines are 6 in. wide.

- All handicap ramps must be located within a crosswalk, including side flares of the ramps. At least one side flare must align as close as possible to the back edge line of the crosswalk.
- Stop lines are white and 12 in. wide (unless otherwise noted) and are located 6 ft. before crosswalk line. Stop lines are parallel to crosswalk lines.
- Dash lines are 4 in. wide, 10 ft. long; with 30 ft. skip spaces. However, the last skip line of each block will vary in width. If it is shorter than 10 ft. long, then it must be connected to the nest to last skip line. All dash lines shall stop 1 ft. before the back edge line of a crosswalk.
- Traffic Guide Lines at an Intersection (two types):

    - Single white dash lines are 4 in. wide, 2 ft. long with 4 ft. spacing.
    - Double yellow guide dash lines are 4 in. wide, located 4 in. apart and are 2 ft. long, with 4 ft. spacing.

- Double yellow lines are 4 in. wide, located 4 in. apart and shall stop 6 ft. before the back edge line of the crosswalk. If no stop line is present the double yellow lines should stop in the same place, as if there is a crosswalk and stop line present.
- Solid white approach lane lines to a signalized intersection are 6in. wide, and begin adjacent to the stop line and continue away from the stop line for a distance of 90-ft. If there are three or more approach lines, then measure the 90 ft. length for the shortest lane line and align all other approach lines with this 90 ft. line on a ninety-degree angle.
- Arrow or work markings are spaced 32 ft. apart, unless otherwise noted.

43.3.2 Special Pavement Marking Areas

- Pennsylvania Avenue, NW between 3rd Street to 15th Street shall have ALL WHITE PAVEMENT MARKINGS, including double white lines. This is a special Historical Street in the Nation's Capitol and does not follow the **MUTCD** guidelines for using double yellow lines. Double yellow lines shall not be used within this area of Pennsylvania Avenue, NW.
- All crosswalks shall have a minimum 20 ft. width whenever possible within the Downtown Central Business District (CBD), including the Downtown Streetscapes Area. This area is currently bounded on the east by 3rd Street, N.W., on the south by Independence Avenue, S.W., on the west by 23rd Street, N.W. and on the north by Massachusetts Avenue, N.W. and includes the full width of the boundary streets. The contractor should always contact the DDOT Transportation Policy and Planning Administration (TPPA) for CBD limits, since the CBD limits are occasionally modified and TPPA determines the limits. Except in all residential areas (no commercial buildings present) the crosswalks may have a minimum width of 15 ft.

- All crosswalks throughout the rest of the city shall be 15 ft. wide, unless otherwise noted.
- Arrow Or Word Pavement Markings - Arrow or word pavement markings shall be white and spaced 32 ft. apart, unless otherwise noted.
- Restricted Lane Diamond Symbols - Restricted lane diamond symbols shall be white and spaced 120 ft. apart.
  NOTE: Restricted lane diamond symbols denoted bus lanes. Bus lanes, however, have been removed by DDOT but the symbols can remain in the manual.)

43.4 Stop Lines

- Stop lines are white and 12 in. wide.
- Stop lines are to be parallel to the crosswalk.
- There shall be a 6 ft. clear space between the back edge line of the crosswalk line and the stop line.
- Stop lines are required at all signalized intersections, unless otherwise indicated. Must have a valid reason for not including at that location.
- When a Stop Sign is present a Stop Line is required. Stop lines should align with the Stop Signs if possible.
- Stop lines can be installed at other locations as specified by the Traffic Services Administration.

43.5 Lane Lines

- Dash Lines - Dash Lines shall be 4 in. wide, 10 ft. long with 30 ft. skip spaces in between.
- Intersection Traffic Guidelines shall be white, 4 in. wide, 2 ft. long with 4 ft. long skip spaces. Also, Intersection Traffic Guide Lines can be double yellow lines. Double yellow lines are 4 in. wide, located 4 in. apart.
- Centerline Striping - All centerline striping shall be double yellow, each 4 in. wide, with a 4 in. minimum gap in between. Centerline Striping will be placed on roadways less than 34 ft. width, only if the centerline is offset.
- Broken Line - All Broken Lines shall be white and 4 in. wide.
- Reversal Lane Lines are always striped with double yellow lines for all reversible unbalanced traffic lanes during peak rush hours. The existing double yellow lines are 35 ft. long with 5 ft. spacing. The adjoining Reversible Lane Line is double yellow and is 10 ft. long and aligns with the approach to the intersection direction and aligns with the beginning of the 35 ft. double yellow line.
- Turn Bay Line - All Turn Bay Lines shall be created with an 8 in. wide dotted line. However, if a Turn Bay occurs on a horizontal curve, it shall be marked with short 8 in. wide dotted lines (2 ft. long with 4 ft. gap).
- All parallel curb-parking lanes shall be 8 ft. wide with 6 in. wide edge, lines separating it from the adjacent 11 ft. wide travel lane.

- Parking Stalls and Angle Parking - All striping for parking shall be white and 4 in. wide. All edge lines of parking areas shall also be white and a minimum of 4 in. wide.
- Bike Lanes – The stripe nearest the curb or parked car shall be 4 in. wide. The stripe dividing the Bike Lane from the travel lane shall be 6 in. wide, per **AASHTO and MUTCD** guidelines as approved by the DDOT Bicycle Coordinator with TPPA. Bicycle Lane Symbols and directional arrows are spaced 6 ft. apart within the 5 ft. wide bike lane.
- The width of the bike lane shall be 5 ft., or 4 ft. where the distance between curb and inside stripe is 12 ft. including parking.
- Signalized Intersections - At Signalized Intersections, starting from the stop line, all approach lane lines shall be at a minimum 90 ft. long. At the end of the 90 ft. line, align all other approach lane lines so they are all normal to the roadway. From this point, begin the 30 ft. skip spaces and 10 ft. lane lines. At the end of each block, the last skip lines shall not be less than 10 ft. long. If it is less than 10 ft. in length it must be connected to the next to last dash line. When one dash line is less, match all of the other adjoining dash lines to make a uniform appearance.

43.6 Double Yellow Center Lines

- Double yellow centerlines are two 4 in. wide yellow lines, separated by 4 in. wide spacing.
- Double Yellow Center Lines are to be marked on all roadways that have sufficient width to allow for two eleven-foot travel lanes and two 8 ft. parallel curb parking lanes, with a minimum street width 38 ft.
- Also, in neighborhoods on local streets, with a minimum 34 ft. street width shall have double yellow center lines are to be marked on all roadways that have sufficient width to allow for two 10 ft. travel lanes and two 7 ft. parallel curb parking lanes.
- Double yellow center lines on undivided roadways where four or more lanes are available for moving traffic at all times shall be a double yellow lines.
- Double yellow centerlines will be placed on roadways less than 34 ft. in width only if the centerline is offset.
- A 20 ft. section of the double yellow center line will be marked, from the stop bar back, on two way roadways of 32 ft. street width or less when this roadway approaches a controlled intersections.
- The double yellow centerline should be brought up to the stop line, or to where such a line would be if there is no stop line, unless otherwise noted.

43.7 Crosswalks

Crosswalks are to be marked at the following locations*:

- Intersections of arterial streets with other arterial streets.
- Intersections of arterial streets with collector streets.

- Intersections of collector streets with other collector streets.
- Intersections or mid-block locations controlled by vehicular and/or pedestrian traffic signals or ALL-WAY STOP signs.
- Diagonal line or parallel line crosswalks are required when intersections are adjacent to school blocks, and along selected home school routes, within four blocks of a school.
- From all bus stops to the nearest crosswalk at an intersection.
- Handicap ramps must be included within a crosswalk at all times. Handicap ramps must be installed in pairs of two, one for each pedestrian travel direction. Any corner and/or mid-block crosswalk having handicap ramps.

*Exceptions to the above rules are possible, when there is a crosswalk omitted due to dangerous situation for the pedestrians. All exceptions must be approved by the Traffic Services Administration (TSA)."

43.7.1 Definitions of Crosswalk Lines

Crosswalk lines are 6" wide white lines and a minimum of 10 ft. wide located at the intersection or in mid block to designate the areas in which pedestrians walk to cross a street. Refer to AASHTO or the MUTCD for any additional requirements.

Symbolic signs indicating NO PEDESTRIAN CROSSING must have a sign located below this sign USE CROSSWALK (arrow indicating direction). This sign directs the pedestrians which crosswalk to cross the street in a safe manner. Signs must be place at the crosswalk.

43.8 Minimum Parking Distance From A Crosswalk (Location of Parking An Intersection)

NOTE: NO PARKING IS ALLOWED WITHIN AN INTERSECTION

43.8.1 General Restrictions

- If there are restrictions limiting where parking is allowed, these are the following signs which will limit the distance to and from each intersection as to where parking will be allowed: NO STANDING OR PARKING ANYTIME, NO PARKING ANYTIME, NO STANDING OR PARKING METRO BUS ZONE, NO PARKING OR STANDING with (RUSH HOUR/TIME LIMIT RESTRICTIONS).
- If no parking restrictions are present, then parking spaces shall be installed as follows:

- If a stop line is present or if a stop line is not present, parking is restricted to within 40 ft. of the intersection (P.I.)

43.9 Diagonal Lines

Diagonal lines are to be used to call attention to areas not intended for vehicular use. The following is a partial list of these areas:

- Gore Areas
- Painted Channeling Island
- Obstruction Markings
- Paved Shoulders, where necessary.

Diagonal lines are to be 12 in. wide spaced 5 ft. on center (O.C.). They are to be placed 45-degrees to the line forming the perimeter of the area.

43.10 Pavement Marking Messages (Symbols, Arrows, Words)

- When approaching an intersection all turning lane messages shall begin with an arrow, followed by the word "ONLY" and end with an arrow. This entire message usually fits within the 90 ft. solid lane limit
- When installing a longer turning lane the message it shall be read as follows: arrow, word" ONLY", arrow, word "ONLY" and arrow. This message always begins with an arrow and ends with an arrow, using the word "ONLY" twice, and using arrow symbol at the beginning, in the middle between the "ONLY" and ending with an arrow.
- When using a combined share arrow markings, i.e. left and through arrow and an adjacent lane using arrow and/or word messages, all arrows of each lane should align with each other.
- General - Preformed Thermoplastic shall be used on all pavement markings such as arrows, crosswalks, railroad crossings, school crossings, stop bars and bike symbols.
- Preformed Thermoplastic Pavement Marking shall be used for asphalt pavement and Preformed High Contrast Tape Pavement Markings shall be used for Portland cement concrete pavements. Prefabricated legends and symbols shall conform to the applicable shapes and sizes as outlined in the MUTCD.

43.11 Permanent Striping

Thermoplastic Pavement Markings shall be placed on all asphaltic concrete surfaces and High Contrast Tape Pavement Markings shall be used for Portland Cement Concrete (PCC) surfaces as directed. Unless there is an emergency, striping is not to be placed when the ambient temperature is below 50^0 F.

43.12 Temporary Striping

When approved, temporary striping shall be required prior to the re opening of a roadway for travel where pavement or permanent striping cannot be completed due to construction staging, weather or time constraints.

All pre-markings shall be of the same general color as the pavement markings being pre-marked. When tape is used as pre-marking, pre-marking shall consist of 4 in. by 4 in. max. Squares or 4 in. max. Diameter circles spaced at 25 ft. minimum intervals. At locations where the pavement markings will switch colors, e.g. gore marking; the ends of the markings may be pre-marked regardless of the spacing.

No pre-markings shall be installed when the ambient temperature is below 50^0F and In no case will the use of temporary lane markings require destructive measures, such as grinding, for removal from permanent roadway surfaces.

43.13 Traffic Signing

43.13.1 General

- Type and Location of Signs - The TSA shall make the final determination regarding the type and location of signage controls within the ROW. The controls shall include traffic control signs, street name signs, delineators, and permanent barricades.
- No sign of any type can be mounded within an individual tree box.
- Signs should not be mounted on any wood poles, belonging to the telephone and/or PEPCO companies, unless owned by the District of Columbia.
- Design - All design shall be in accordance with this chapter and the latest revision of the MUTCD.
- Sign Posts, Supports and Mountings - Sign posts and their foundations and sign mountings shall be constructed to hold signs in a proper and permanent position, to resist swaying in the wind or displacement by vandalism.

  - Sign Posts shall be steel drive posts and shall be 12 feet in length and weigh 3 lbs/ft. (before punching and galvanizing). Posts shall be manufactured in accordance with ASTM A-499, Grade 60 with a minimum yield strength of 60,000 psi. Galvanizing shall be in accordance with ASTM A-123. Special poles, such as aluminum poles, will be used for special situations, such as street name signs, with the approval of TSA representatives. Posts are to be driven 3 feet into the ground or encased in concrete as directed.

- Post Bolts - Two, 5/16" x 2" & 2/12" Hex Head plated nuts and bolts (Full threaded) are used to attach sign posts to sign anchor (stubs). These bolts are installed a distance of two of the pre-drilled post holes apart, and at 90 degrees to one another.
- Sign Bolts - Signs are mounted to the post with a minimum of two bolts (5/16 in. with nylon and metal washers) or standard rivets (TL3806 EG, drive rivet) with nylon washers placed against the sign face. The bolt or rivet system is used to fasten signs to the Telspar post.
- Other Sign Mounts - Streetlights and approved utility poles, when located appropriately, may be used for signs such as warning, parking, and speed limit signs. Streetlight locations should be checked for potential sign installation during the design process and shown on the sign plan sheets. Signs installed on streetlights and utility poles are installed with stainless steel straps, buckles and sign mounting brackets with appropriate standard nuts and bolts of appropriate lengths and widths.
- Breakaway Post System - Posts must be of appropriate length to comply with MUTCD specifications for the location, must conform to the Federal breakaway standards.
- Sign Reflectivity - All traffic control signs must be fabricated with reflective materials. All regulation signs, such as stop signs, one-way signs, etc. must use Diamond Grade Sheeting. For all other signs High Intensity Grade sheeting shall be used. Engineer Grade sheeting may only be used if authorized by TSA for signs of less importance. Sheeting for all School Zone (S1-1) crossing signs and sheeting for all mid-block Pedestrian and Advanced Pedestrian crossing (W11-2) signs shall be Fluorescent High Performance Lime Green – Diamond Grade.
- Backing Plates - Aluminum sign thickness of all traffic signs shall be 0.125 gauge. For all other message signs, such as neighborhood watch signs, a lesser gauge may be used with authorization by TSA.
- Street Name Signs

43.13.2 Traffic Control Signs

- Design and Size - Sign specifications and diagrams are detailed in the latest revision of the **MUTCD**. This publication is available from the U.S. Department of Transportation, Federal Highway Administration. Acceptable sign sizes are listed in the standard column of the table printed with each diagram. Expressway and construction signs shall be a minimum 36 in.
- Mounting - Signs should be mounted on existing streetlight and power poles, with new posts being used only if necessary. Streetlight locations should be checked for potential sign installation during the design process and shown on the signing and striping plan sheets. The use of stainless steel banding of signs is acceptable for fiberglass and steel poles.
- Regulatory

- Sheeting Material - All signs shall be fabricated with only sheeting material, including letters. No silk-screened signs will be permitted.
- Stop Sign - Stop signs shall be a minimum of 30 in.
- Yield Sign - For minor intersections only, a yield sign may be used in lieu of a stop sign, at the discretion of the District according to **MUTCD**.
- Speed Limit Sign - All Collectors and Arterials should have speed limit signs in accordance with the **MUTCD,** latest edition.
- Parking/No Parking Sign - Designated parking and "no parking" zones shall be signed in accordance with **MUTCD**.

43.13.3 Roundabouts

43.13.3.1 Modern Roundabouts

Signage in advance of the circulating roadway shall be required. Use "Yield At Roundabout" (W3-2a, 36 in. by 36 in.; R1-2, 36 in. by 36 in.), "Roundabout Advisory Sign" (RB-1, 24 in. by 24 in.) and "Reduced Speed Ahead" (R2-5a, 24 in. by 30 in.) signs. The "Yield" sign (R1-2, 36 in. by 36 in.) shall be located at each entry to the circulatory roadway. An "arrow" sign, designating direction of travel in circulatory roadway, shall be located within the central island.

NOTE: If any pedestrian crossings are provided at these roundabouts, Advance Pedestrian (symbolic pedestrian, without crosswalk lines on sign) signs will be needed for all approaches to the intersections. Place the advance signs a minimum of 150 ft. before the crosswalks and another Pedestrian sign at the crosswalk (with crosswalk lines on sign).

43.13.4 Bus Stop Signage

The Metro Bus stop sign should be located at the beginning of the bus stop after the 50 ft. taper. These signs will be installed by the Washington Metropolitan Area Transit Authority (WMATA).

"No Standing or Parking – Metro Bus Zone" signs should be posted at both ends of the bus stop. These signs will be installed by DDOT.

43.14 Standard Dimensions for Various Stall Widths and Angles

The Family Vehicle Classification includes the following vehicles: sub-compact, compact, standard car, large car, station wagons, 7-seat passenger vans, SUV's (4-5 passengers only), and a large pick-up truck (excluding second seats and extended cabs). The table indicates the dimensional relationship between stall width and adjacent aisle width. As the stall width narrows, the adjacent aisle width must be made wider to compensate for the extra maneuvering required for a vehicle to enter and exit a parking space.

- A typical family within the United States uses at least one of these vehicles.
- The average opening of a car's door is 3'-8".

The rest of this page intentionally left blank.

43.14.1 Typical Family Vehicle Dimensions:

Vehicle Type	Length	Width	Height	Rear Overhang
Subcompacts:	11'-7" – 14'-8"	5'-1" – 5'-8"	4'-2" – 4'-7"	3'-9"
Compacts:	13'-10"– 15'-4"	5'-7" – 5'-8"	4'-4" – 4'-8"	4'-3"
Mid-size Cars, Station Wagons:	15'-0" – 16'-8"	5'-7" – 6'-0"	4'-2" – 4'-9"	4'-4"
Large Cars, 7-seat Passenger Vans, SUV's (small):	15'-2" – 18'-5"	5'-8" – 6'-0"	4'-7" – 5'-0"	4'-5"
Large Pick-up Trucks:	15'-10"– 20'-2"	6'-5" – 6'-9"	5'-9" – 6'-4"	4'-4"

- The Family Vehicle Classification Table above shows the minimum dimensions for the various stall widths and angles required when parking these vehicles.
- The DC Regulations require 8 ft. wide standard for parallel parking spaces to a curb and 9 ft. standard for all angled parking spaces.